DIGI FEST 2021

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Accessible Technology 4.0, Inclusion 2.0: So, What Next?

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Aims of this Presentation

To discuss the nature of accessible and inclusive technology

To allow you to critically evaluate the role of technology in the support of students with access needs in educational environments

To evaluate the inclusive nature of a contemporary mainstream technology

To start you thinking about how you may develop future learning strategies and the use of technologies

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A brief history of how we got to here

Medicalized and Assistive Technologies

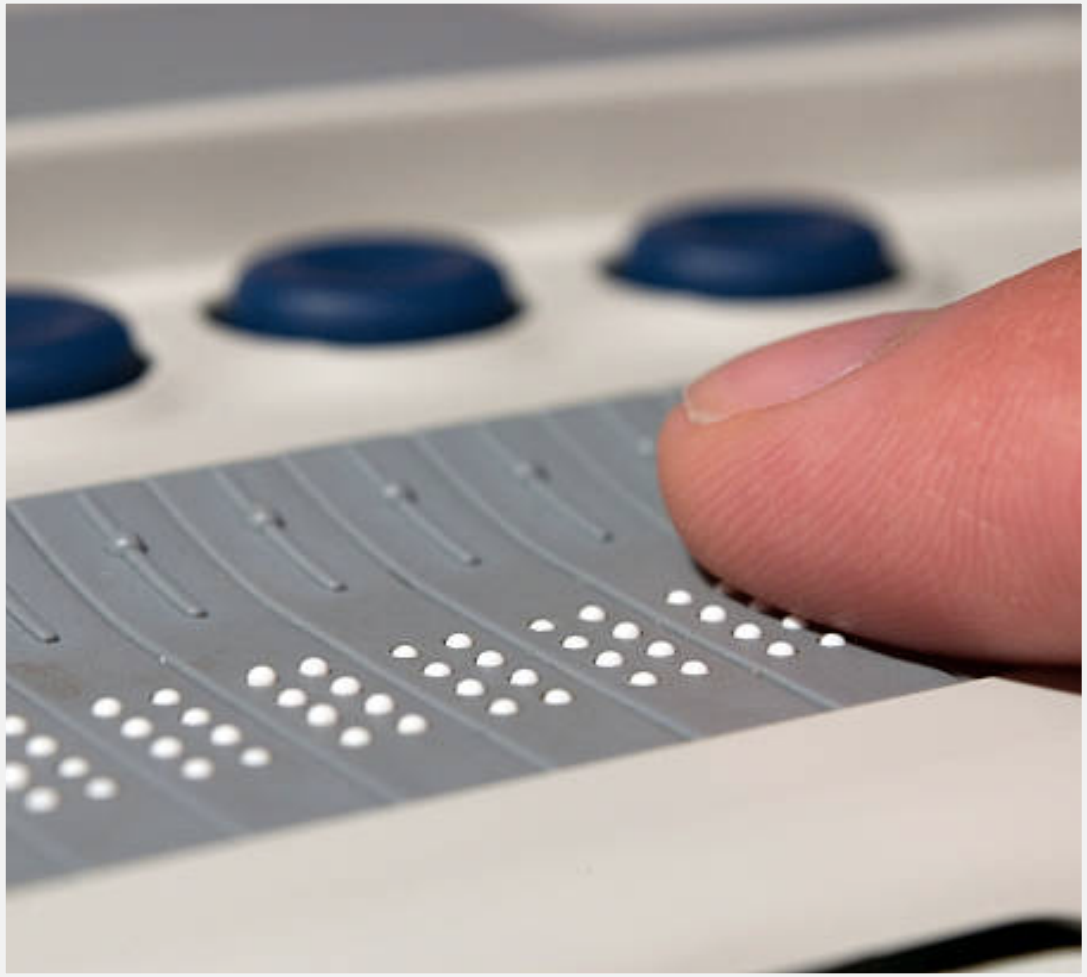
First Generation (1.0) – The Medicalization of Disability

- Mostly involved separation in homes, asylums or institutes
- People taught to use them for a living in asylums, workshops and schools
- Defined according to impairment
- Highlighted issues of infirmity, incapacity, injury or impairment
- Aim to look after ill people:
  - To relieve physical deficit
  - Hence the term Handicap
- Physical disabilities targeted
- No thought given to intangible impairments or difficulties

Hayhoe, S., 2015. Philosophy as Disability & Exclusion. Charlotte, NC: IAP.

Second Generation (2.0) - Disability and Assistance

- Aim still to overcome deficit
- Integrated in environment but not in tasks
- More technology focused:
  - Emphasis moved from medical to social and cultural task assistance
- Often associated with education or assisted living: mobility, reading, writing or hearing
- Most famously, assistive technology
  - A mixture of mechanical & electrical technologies



The Problem with the Second Generation

Any physical defect provokes a social sprain, with unavoidable consequences. It goes without saying that blindness and deafness are biological facts and not at all of a social nature, but the teacher has to deal not so much with the facts as with the social consequences of these facts. When we have a blind child as an object of education before us, [for instance,] we are compelled to deal not so much with the blindness itself, as with the conflicts which arise therefrom within the child when it enters life. (pp. 19-20)

Vygotsky, L. S. (1994). The Vygotsky reader (R. Van der Veer & J. Valsiner, Eds.). Oxford, England: Blackwell Publishers.

Where we are now

Inclusive Technologies

Third Generation (3.0) - Disability and Inclusion

- Interface led
- Inclusion in Tasks and Environment
- Inclusion based on striving for fuller equality with others – especially in tasks and practice
- Thus, inclusion seen as practice focused
- Emphasis again on technology, but this time on inclusive technologies:

  Mainstream technology that can be used with either no or minimal adaption by a person with a disability as an accessible technology. It is also seen as technology that provides social inclusion, such as communication and interaction, for people with disabilities

Hayhoe, S. (2019). Inclusive technical capital in the twenty-first century. In S. Halder, & V. Argyropoulos (Eds.), Inclusion, Equity and Access for Individuals with Disabilities: Insights from Educators across World (pp. 223-241). Singapore: Palgrave Macmillan. https://doi.org/10.1007/978-981-13-5962-0_11

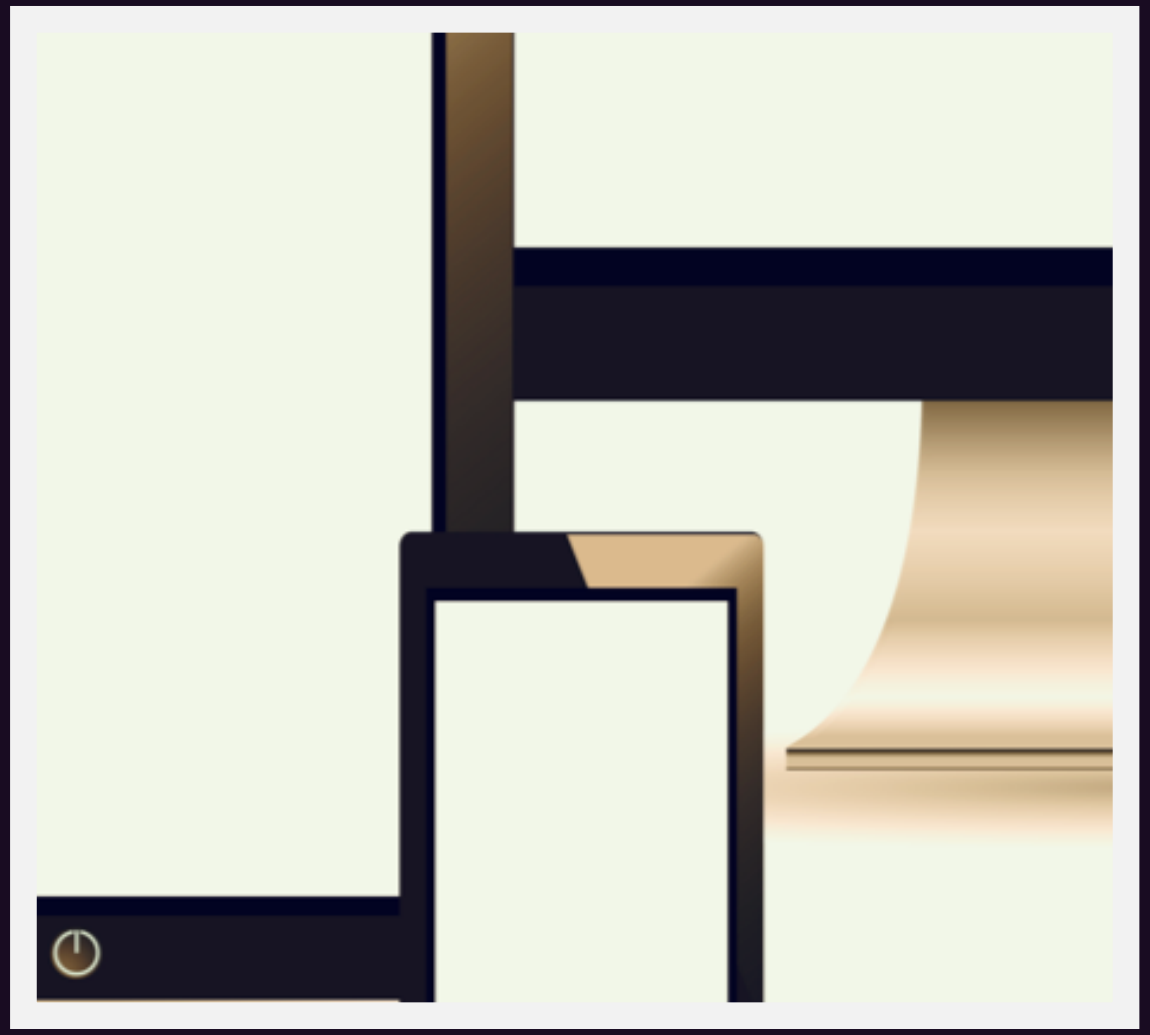
Access Through Technological Design

Inclusion is developed through physical aspects of design, e.g.

- The look of the interface
- The sounds created by the interface
- The tactile and physical nature, such as:
  - size and weight
  - tactile information

An evaluation of the needs, skills and mobility of technologies

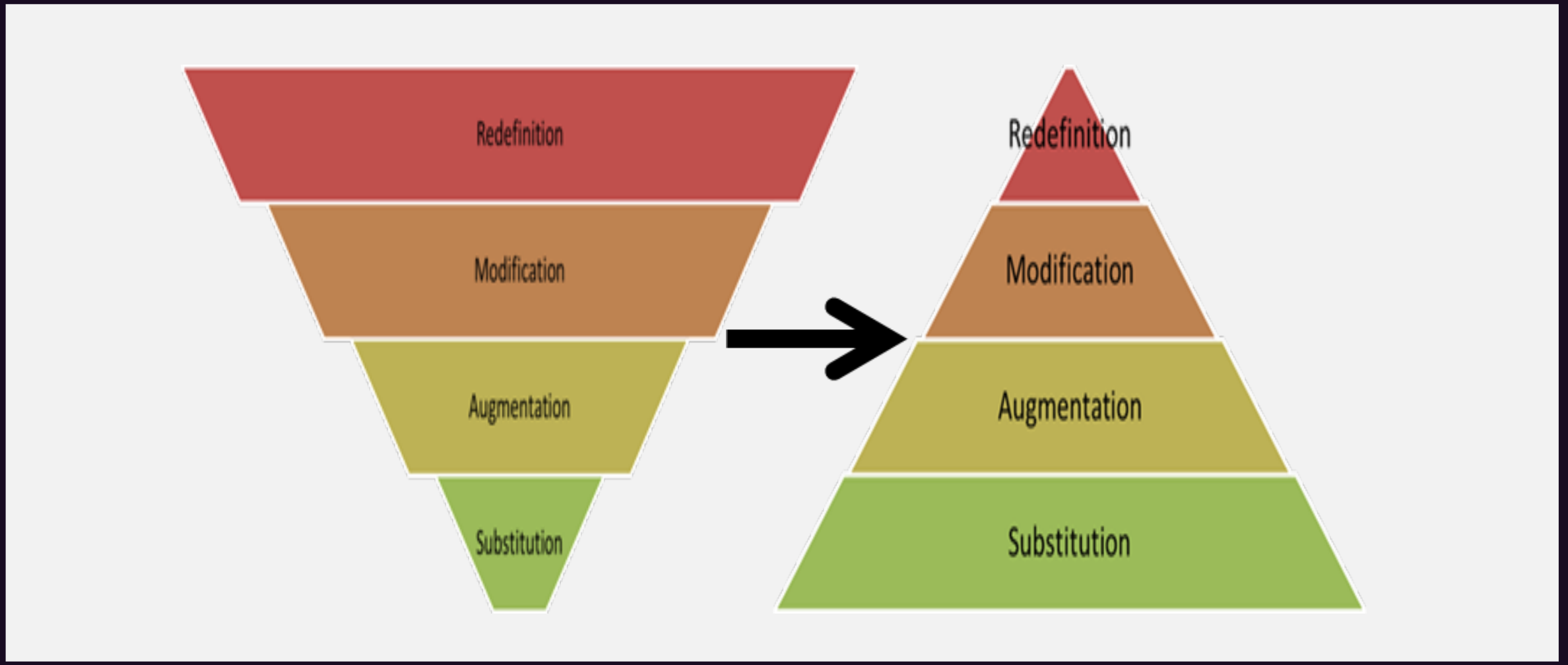
Mainstream apps that can be used as inclusive technologies



Inclusion Measured by SAMR Model

Transformation		
Redefinition	Technology prompting the training of new skills	Customised technology that allows students to write or read using alternative technologies, such as the Perkins Brailler.
Modification	Technology prompting the significant redesign of tasks	Customised technology that allows teachers and students mobility, writing facilities, reading facilities, hearing facilities
Augmentation	Technology mirrors an existing tool, with functional improvements	Accessible settings, such as voice recognition
Substitution	Technology acts as a replacement, with no functional change	Tablet computers, smart phones, mp3 players and multimedia devices with differing inputs and outputs
Enhancement		

SAMR Pyramid and Inclusion



Is This Technology Truly Inclusive?

Positives:

- Allows people with disabilities to be included in mainstream technological usage and environments, and user to be involved in mainstream education
- Less expensive and more ergonomically designed than separate assistive technologies

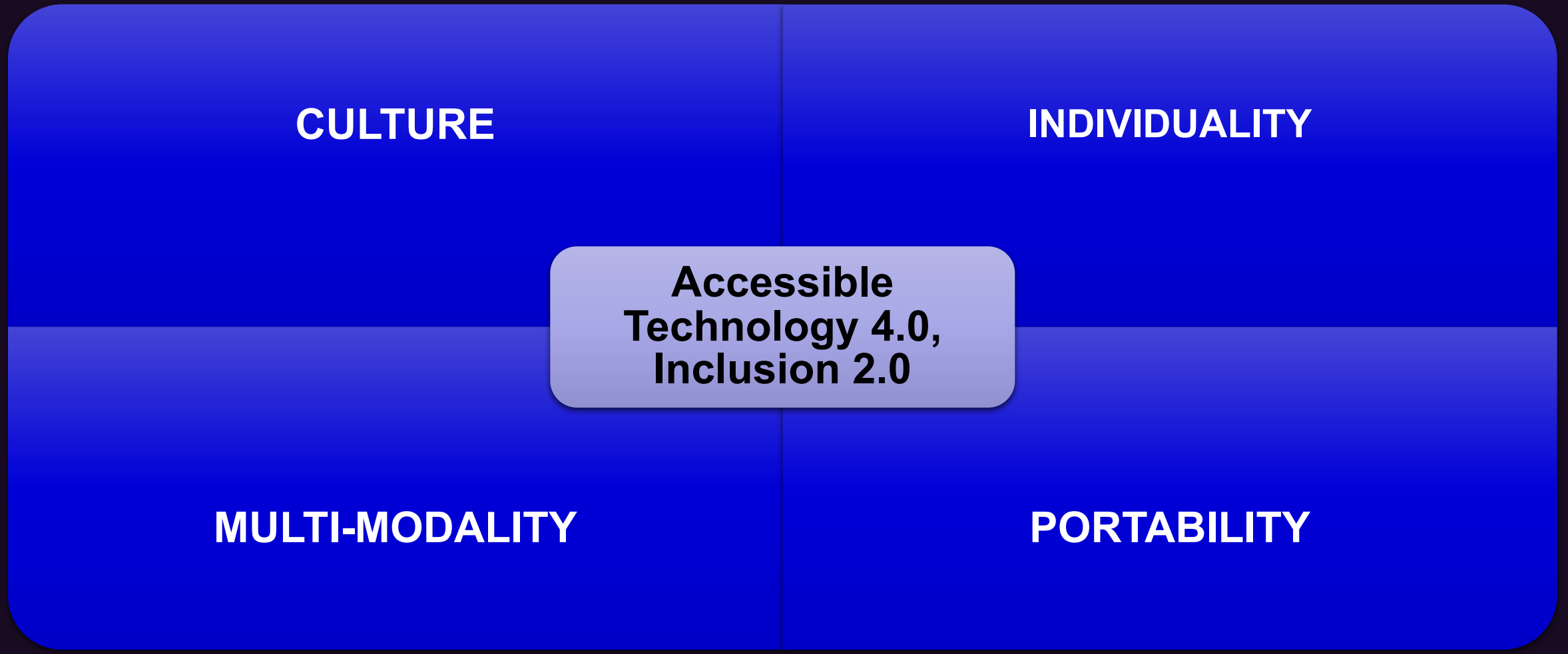
Negatives

- Still classifies people according to individual impairments, such as visual or hearing impairment
- Still regards people as disabled and encourages separate usage, apps and can be culturally insensitive

The future?

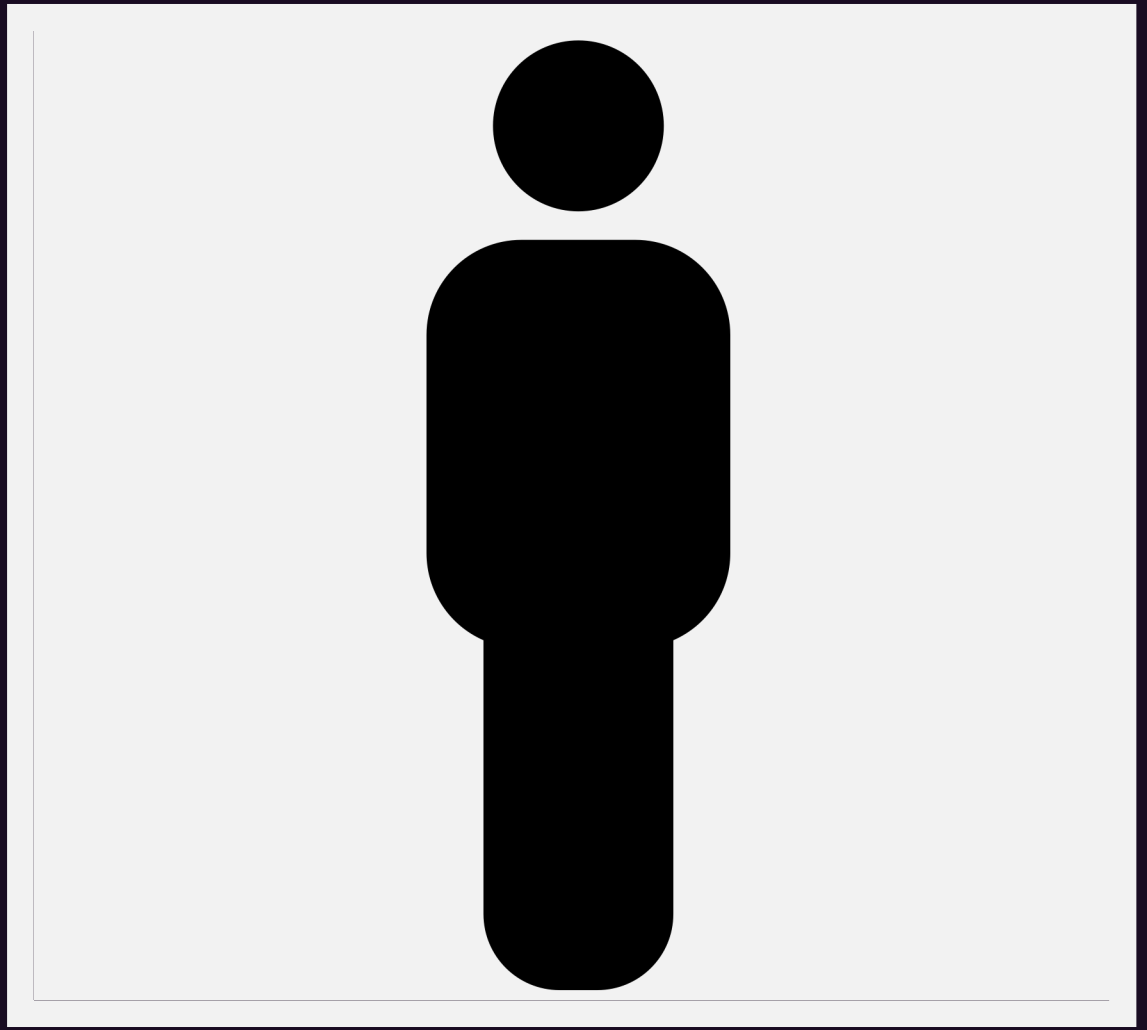
Culture, Multi-Modlaity, Portability and Individualisation

Inclusion 2.0, Accessible Technology 4.0 – CIMPo



Inclusion 2.0 – Culture, the Person and the Interface

- Redefine disability as individual access needs – ARCHES findings
- Person centred not group centred
- Considering all people have access needs
- Not just universal design, a deep social and cultural understanding
- Participatory Co-Design
  - Groups consist of users with a range of access needs
  - Involved in the design of education, arts and technology from the ground up



Accessible Technology 4.0 – Individuality and AI

- Technology to adapt to different needs according to the device – ARCHES findings
- Technology that can learn the access needs of the user
- The ability to calculate the best settings and the most appropriate device to use
- The ability to develop learning and sensory stimulation
- HOWEVER, there are dangers:
  - Again we need to guard from institutional bias

Accessible Technology 4.0 – Multi-Sensory Inputs

Going beyond our understanding of making sound, touch and sight individually accessible – see Please Touch!

Developing interfaces that use all the senses working together

Developing intelligence that can ”fill in” where someone has a sensory impairment

Stimulates imagination and creativity

Has a role in child development, being able to stimulate and develop sensory motor skills

Provides more “universal” information

Accessible Technology 4.0 – Portability and IoT

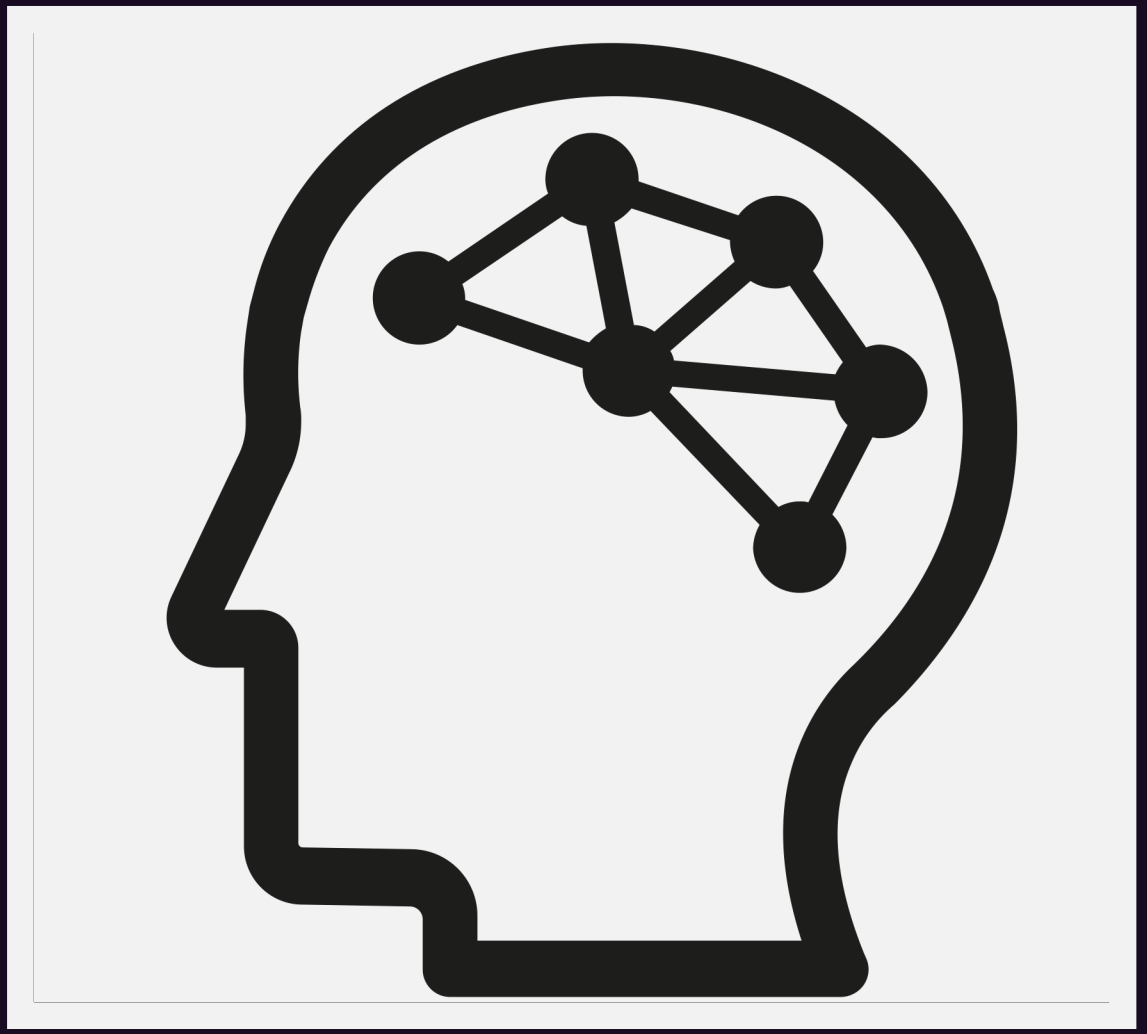
- Not just mobile technology but portable settings
- The ability to have an accessible signature that you can carry around with you
- The ability to transfer your user settings from one device to another
- The ability to let others know your specific needs if you need support
- HOWEVER, this brings dangers of
  - data hacking
  - institutional biases

Three Takeaway Messages

What are known as medical or assistive technologies started out as separate forms of technology, but in more recent years have converged – however, these traditions still persist

Technologies have not just supported students, they have effected the way that students learn, they environments they engage with and the way they socialize

The development of digital technologies have started a new, inclusive journey for students with access needs



Thank you

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